

HiCAMS User Guide

Chapter 5: Contract Tracking

Section 7: Audit Materials

About Audit Materials

The **Audit Materials** function was introduced in HiCAMS V5.9 (January 21, 2005). This module incorporates many aspects of the Contract Materials Discrepancy, Contract Materials w/ Line Items, and Contract Quantity Statistics reports into a single Report with dynamic access to source documents. Users are also provided with a Notes field for each material where explanations for the system identified Discrepancies can be noted.

This function retrieves all source records: MRRs, Tickets, Pay Records, Work Items, FIRs, and Samples associated with a contract and computes aggregate material quantity received, accepted and paid, and marks material quantity discrepancies (Paid vs Accepted vs Received).

This function:

1. Reads the database to accumulate all MRRs, Tickets, Pay Records, Work Items, FIRs, and Samples associated with a contract each time the window is used to generate project certification information for a contract or a project certification standard report is generated. This process will take several seconds to a few minutes, in contrast to reports that have existed in previous HiCAMS releases which used to read from a pre-computed set of contract material quantities data.
2. Displays material quantities in an order to set focus to the critical materials with quantity discrepancies first.
3. Provides Status columns to allow both Construction and M&T staff to independently mark the materials that they have reviewed and also a Notes column to document their research/findings.
4. Allows a Material drill-down to source detail.
5. Provides Date, Line Item, and Material filters, and options for sorting and grouping the retrieved data, while allowing simultaneous print previews of the same. You can do a Print Preview of the data sorted and displayed with one set of parameters, and then select different settings and generate a second report. Both print previews will remain active.
6. Accumulates and displays additional information pertaining to calculation of contract material quantities about a source record and its material.
7. Displays the Minimum Sampling Guide logic used to derive the Material Quantity accepted from a source record.

The original discrepancy reports (Contract Materials Discrepancy, Contract Materials w/ Line Items, and Contract Quantity Statistics reports) have temporarily been retained in HiCAMS with inclusion of additional fields for criteria and display, but will be discontinued in the near future.

Note: The same module is launched from the menu option **Functions -> Project Certification -> Review Project Certification**.

The Audit Materials Window

To work with the Audit Materials window, go to **Functions -> Contract Tracking -> Audit Materials**. Enter the Contract Number whose project records you wish to review in the Contract field.

Note: For information on ways to find your contract number, follow the "HiCAMS Basics" link on the User Guide section of the HiCAMS Home Page.

Below is an example of the Audit Materials window for contract C201346.

Note: Pay attention to the Date and Time following Material Quantities. Any corrections made to data will not appear in this window until the report is Generated again.

HiCAMS - [Hicamsprod]

File Edit Functions Inquiries References Admin Tools Window Help

Audit Materials (C201346)

Contract Material Quantities Detail Previous Material Quantities Log

Contract: C201346 Contractor: S. T. WOOTEN CORPORATION Status: Activated

Description (nickname): 2005 Granville County Resurfacing (Re) Generate

Material Quantities (as of 1/20/2006 21:01:11)

Critical	Material	Constr Status	M&T Status	Notes	Plan	Estimated	Paid/ Used	Accepted	Received	A
Critical	Asphalt Concrete Base Co	TBR	TBR		11,389.000	6,254.120	6,254.120 *	.000	6,254.120	
Critical	Asphalt Concrete Surface	TBR	TBR		4,630.000	4,476.930	4,476.930 *	.000	4,476.930	
Critical	Asphalt Concrete Surface	TBR	TBR		10,064.000	6,220.650	6,220.650 *	.000	6,220.650	
Critical	Permanent Raised Paveme	TBR	TBR		859.000	1,010.000	1,010.000 *	.000	.000	
Critical	Asphalt Binder, PG 64 - To	OK	OK		1,324.000	975.267	.000	.000	.000	
Critical	Asphalt Concrete Base Co	OK	OK		11,389.000	6,254.120	.000	.000	.000	
Critical	Asphalt Concrete Surface	OK	OK		4,630.000	4,476.930	.000	.000	.000	
Critical	Asphalt Concrete Surface	OK	OK		10,064.000	6,220.650	.000	.000	.000	
Critical	Patching Existing Paveme	OK	OK		775.000	921.220	.000	.000	.000	
Minor	Asphalt Plant Mix, Paveme	TBR	TBR		775.000	921.220	921.220 *	.000	921.220	
Minor	Fertilizer - Tons	TBR	TBR		15.230	9.450	9.450 *	1.688	1.688	
Minor	Incidental Stone Base - To	TBR	TBR		841.000	547.090	547.090 *	.000	547.090	
Minor	Limestone (Agricultural) - T	OK	OK		15.230	9.450	9.450	19.336	19.336	
Non-Criti	Glass Beads - Pounds	TBR	TBR		113,088.000	91,590.000	91,590.000 *	28,000.000	28,000.000	
Non-Criti	Seed - Pounds	OK	OK		.000	.000	.000	722.500	722.500	
Non-Criti	Thermoplastic for Marking	OK	OK		30,937.236	37,124.594	37,124.594	48,000.000	48,000.000	
Non-Criti	Thermoplastic for Marking	OK	OK		37,884.480	30,682.650	30,682.650	48,000.000	48,000.000	

1 to 17 of 17 rows

Ready

Column Definitions for Contract Material Quantities Tab

Critical: The Minimum Sampling Guide Project Certification Criticality code. The MSG Project Certification Criticality Codes are as follows:

Critical: Materials with an MSG Project Certification Code set to CRITICAL would include all Materials which are required for Project Certification. These Materials must be entered using the Review Tickets or Review Materials Receipts window.

Non-Critical: Materials with an MSG Project Certification Code set to NON-CRITICAL would include all Materials which are required for Tracking purposes. These Materials must be entered using the Review Tickets or Review Materials Receipts window.

Minor: Materials with an MSG Project Certification Code set to MINOR would include Materials which are required for Sampling purposes or which are incidental to other work. These Materials would not require entry through the Review Materials Receipts window but may require Ticket Book Entry.

Material: The Material Description for Materials found on this project.

Constr Status: The predefined values for this column are:

Entry	Stands for:	Required Action:
OK	No discrepancy	OK indicates that the Material Quantity Paid is less than or equal to the Material Quantity Accepted AND that the Material Quantity Accepted is less than or equal to the Material Quantity Received. No action needed
TBR	To Be Reviewed	The Material Quantity Accepted is less than the Material Quantity Paid OR the Amount Accepted is greater than the Amount Received. The difference should be investigated and explained.
RVWD	Reviewed	The discrepancy is investigated and the reason is noted in the Notes column. This is the only status is set by the user.
CSR	Changed since Reviewed	The Amount Accepted is less than the Amount Paid after a re-generation of the data. NOTE: It is also possible that a material which was OK before the re-generation changes to TBR based on data entry which has occurred.

M&T Status: These statuses are the same as those in the table above.

Notes: A running log of comments made by Construction and Materials and Test Users. Click the Notepad icon to enter a new note or read the ones previously entered. **Comments cannot be erased!** Here are some examples of the kind of comments to be entered.

"Reviewed Density and QA records and applied appropriate penalties. See PAR 5."

"Pipe has already been backfilled and can not be inspected. Accepted by Resident Engineer."

"Small Quantity indicator should have been checked."

"Concrete Pipe cannot currently be certified by contract in HiCAMS."

"This material is not received"

"Sample entered for wrong material."

It is not necessary to enter comments when you are still investigating a discrepancy, i.e. there is no need to enter a note such as "working with SMS to resolve difference"

Plan: The Contract Plan Quantity multiplied by the conversion factor. In the example above, the bid quantity for Line Item 11 - Thermoplastic Pavement Marking Lines 4 " - 90 mils is 113,088.000 LF. The conversion factor is 0.335. To obtain the plan quantity of material needed, multiply 113, 088.000 x 0.335. This equals 37,884.48.

Estimated: The calculated amount of material on all Estimates which have a status of Paid PLUS any quantity that has been included on an estimate which is not in the Paid Status. In the example above, the quantity paid to date is 91,590.000 LF. This quantity times the conversion factor (0.335) is 30,682.65.

Paid/Used: The amount of this specific material which has been paid. In the example above, there is an amount in the Paid column for the Asphalt Concrete Base Course Type RB 25.0B but not in the Paid column for the Asphalt Concrete Base Course Type B 25.0B.

* **column 1:** A * in this column indicates that the Paid Quantity is more than the Accepted Quantity.

Accepted: The quantity of this specific material which has been Accepted.

* **column 2:** A * in this column indicates that the Accepted is more than the Received Quantity.

Received: The quantity of this specific material which has been received.

The following columns are not displayed in the picture above. They are found when the window is scrolled to the right. They are the same calculations which appear on the Contract Materials Discrepancy Report.

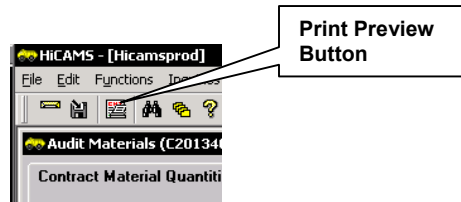
Accepted - Used: The difference between the Accepted Quantity and the Paid/Used Quantity.

Received - Used: The difference between the Received Quantity and the Paid/Used Quantity.

Received - Accepted: The difference between the Received Quantity and the Accepted Quantity.

Reporting Function

It is possible to generate a Printout of the data shown on the Contract Materials Quantities tab by clicking on the Print Preview button.



Below is an example of the Print Preview for Contract C201346

A screenshot of the HiCAMS - [Hicamsprod] application window showing the Print Preview for Contract C201346. The window title bar shows 'HiCAMS - [Hicamsprod]'. The menu bar includes 'File', 'Functions', 'Inquiries', 'References', 'Admin', 'Tools', 'Window', and 'Help'. The toolbar contains various icons, including a printer icon. The main window area shows the 'Contract Material Quantities (C201346 - as of 1/20/2006 21:01:11)' report. The report includes the North Carolina Department of Transportation logo, the contract number, criticality, description, and location. Below this is a table with columns: Critical, Material, Constr Status, M&T Status, Plan, Estimated, Paid/Used, Accepted, Received, Accepted - Used, Received - Used, and Receiv - Accep. The table lists various materials and their quantities. The bottom of the window shows a 'Zoom: 100' slider and 'Page 1 of 1'.

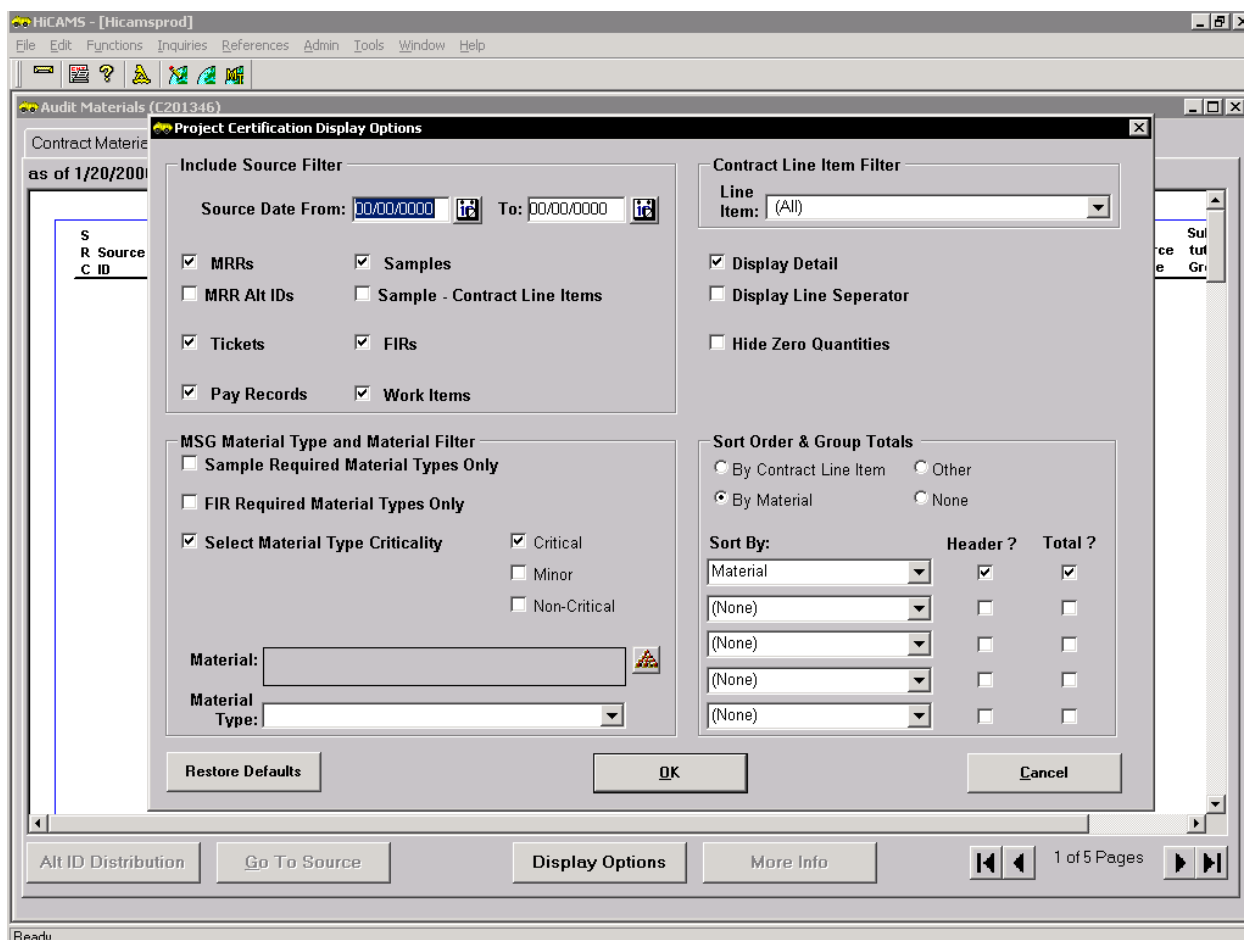
Critical	Material	Constr Status	M&T Status	Plan	Estimated	Paid/Used	Accepted	Received	Accepted - Used	Received - Used	Receiv - Accep
Critical	Asphalt Concrete Base Course, Type RB 25.0B - Tons	TBR	TBR	11,389.000	6,254.120	6,254.120 *	.000	6,254.120	(6,254.120)	.000	6,254.120
Critical	Asphalt Concrete Surface Course, Type RS 9.5B - Tons	TBR	TBR	4,630.000	4,476.930	4,476.930 *	.000	4,476.930	(4,476.930)	.000	4,476.930
Critical	Asphalt Concrete Surface Course, Type RSF 9.5A - Tons	TBR	TBR	10,064.000	6,220.650	6,220.650 *	.000	6,220.650	(6,220.650)	.000	6,220.650
Critical	Permanent Raised Pavement Markers - Each	TBR	TBR	859.000	1,010.000	1,010.000 *	.000	.000	(1,010.000)	(1,010.000)	.000
Critical	Asphalt Binder, PG 64 - Tons	OK	OK	1,324.000	975.267	.000	.000	.000	.000	.000	.000
Critical	Asphalt Concrete Base Course, Type B 25.0B - Tons	OK	OK	11,389.000	6,254.120	.000	.000	.000	.000	.000	.000
Critical	Asphalt Concrete Surface Course, Type S 9.5B - Tons	OK	OK	4,630.000	4,476.930	.000	.000	.000	.000	.000	.000
Critical	Asphalt Concrete Surface Course, Type SF 9.5A - Tons	OK	OK	10,064.000	6,220.650	.000	.000	.000	.000	.000	.000

To print the report, click on the Printer Icon again and print as usual.

Details Tab

The power of the Audit Materials module is in the Details Tab.

When the Detail tab is accessed the first time after a contract's data was retrieved or regenerated, the display options window opens automatically:



Filter Definitions

There are four Filter areas. The default settings give a review of the discrepancies by Material for Critical Materials.

Include Source Filter: The default is for all data which contributes to Paid, Accepted, and Received Quantities.

MSG Material Type and Material Filter: The default display is for only Critical Materials. This filter is useful for investigating discrepancies at the Material level. It provides information similar to the Contract Materials Discrepancy Standard Report.

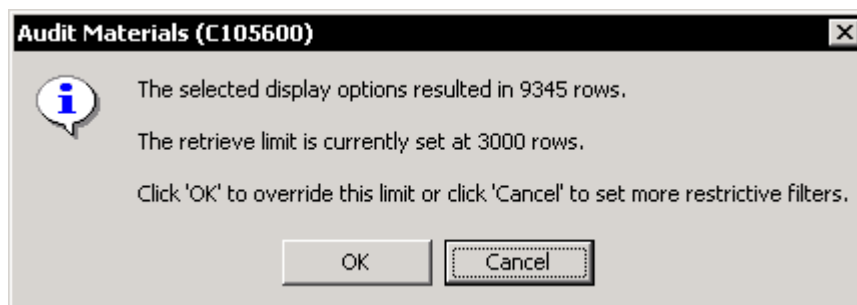
Contract Line Item Filter: The default display is set for all Line Items. This filter is useful for investigating discrepancies at the Line Item level. It provides information similar to the Contract Materials w/ Line Items Standard Report.

Sort Order & Group Totals: The radio buttons define how the data is grouped, and the dropdowns define how the data is Sorted.

View the Report

To view the report, click the **OK** button.

Note: On contracts for which large amounts of data has been entered, you may receive a warning stating:



It is best to **Cancel** the report and review the discrepancies by Line Item or Material. A contract with 5000 rows of data creates a report with 130 pages. This is a difficult quantity to efficiently review.

Here is an example of the default report for Contract C201346.

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Audit Materials (C201346)

Contract Material Quantities **Detail** Previous Material Quantities Log

as of 2/4/2006 21:01:07

S	R Source	Source Quantity	CBOM D	Material Quantity	Source	Source
C ID	Represented	Accepted	Conversion Factor	Paid/Used	Accepted	Received
Material - Asphalt Concrete Base Course, Type RB 25.0B Tons						
T 2	899.040			899.040		899.040
T 1	722.890			722.890		722.890
T 3	761.720			761.720		761.720
T 4	866.180			866.180		866.180
T 5	77.940			77.940		77.940
T 7	672.890			672.890		672.890
T 6	1,076.530			1,076.530		1,076.530
T 9	529.670			529.670		529.670
T 8	430.470			430.470		430.470
T 10	678.130			678.130		678.130
T 11	58.850			58.850		58.850
Total for group Material - Asphalt Concrete Base Course, Type RB 25.0B:				6,774.310	.000	6,774.310
Material - Asphalt Concrete Surface Course, Type RS 9.5B Tons						
T 1	322.950			322.950		322.950
T 2	333.250			333.250		333.250
T 4	836.430			836.430		836.430
T 3	884.670			884.670		884.670
T 5	888.360			888.360		888.360
T 6	696.560			696.560		696.560
T 7	222.740			222.740		222.740
T 8	871.290			871.290		871.290
T 11	719.380			719.380		719.380

Alt ID Distribution Go To Source Display Options More Info 1 of 2 Pages

Ready

Column Definitions for Details Tab Interactive Report

SRC: Stands for Source. Abbreviations for the Source Documents are as follow:

Entry	Stands for:	Notes:
M	Material Received Report	Updates Received, and sometimes, Accepted, Quantities
T	Ticket	Updates Received, and Paid Quantities (unless marked Do Not Pay)
P	Pay Record	Updates Paid Quantities (unless marked Do Not Pay)
W	Work Accomplished	Updates Paid Quantities
S	Sample	Updates Accepted Quantities
F	Field Inspection Report	Updates Accepted Quantities from the following report types: <ul style="list-style-type: none"> - Concrete Pavement - Corrugated Metal Pipe - Guardrail - Stay in Place Forms - Structural Steel

Source ID: The Material Receipt number, Ticket Book number, Pay Record Book and Page number, Sample ID, or Field Inspection Report Number for the quantities on this line.

Source Quantity

Represented: The Represented quantity from the Material Receipt, Ticket Book, Pay Record, Sample, or Field Inspection Report.

Accepted: The Accepted quantity from the Material Receipt, Sample, or Field Inspection Report.

PAR: The quantity from the PAR field for a Sample, or Field Inspection Report.

CBOM Conversion Factor: The Conversion Factor entered on the Contract Bill of Materials report for this material if the source document type is P (Pay Record).

DNP: A * in this column indicates that the Pay Record or Ticket is marked Do Not Pay.

Material Quantity

Paid/Used: The Pay Record quantity multiplied by the conversion factor for the material or the Ticket Book quantity.

Accepted: Accepted quantities from Project Acceptance Samples and Acceptance Field Inspection Reports.

Received: Quantity of the material received on a Material Receipt report or Ticket

Source Status: All source documents are shown on this report. The status column indicates at what stage the item is in its Received, Payment (Not Estimated, In Process, Processed) or Approval (Authorized, Meets Specs, Does Not Meet Specs, etc.) process.

Source Date: The Material Receipt date, Ticket Book date, Pay Record date, Sampled Date, or FIR Inspection Date.

Substitution Group: Indicates which Material can substitute for another. Also points out unnecessary materials which can be deleted from the Contract Bill of Materials.

Previous Material Quantities Tab

The Previous Material Quantities tab shows the previous set of material quantities of the contract, i.e., the material quantities stored and displayed in the Material Quantities tab just before 'Regenerate' was clicked. This is displayed only while the Audit Materials window is open in the current session.

Log Tab

The Log tab shows the activity log of the most recent 10 (re)generations of project certification data for the contract specified. This indicates who executed project certification data generation, from where in HiCAMS, and how long it took on the database server.

How to review discrepancies in the Audit Materials window

To work with the Audit Materials window, go to **Functions -> Contract Tracking -> Audit Materials**.

Step 1: Enter the Contract Number whose project records you wish to review in the Contract field and hit Enter. The Audit Materials window opens to the Contract Material Quantities Tab.

Note: For information on ways to find your contract number, follow the "HiCAMS Basics" link on the User Guide section of the HiCAMS Home Page.

Step 2: The Critical Materials with a negative Accepted minus Paid quantity appear at the top of the list. These are the ones which must be reviewed. Materials which are Non-Critical or Minor should be reviewed as well. These materials have a * in the column between Paid/Used and Accepted columns.

Step 3: Click on the Detail tab, and generate the default report. For larger contracts with many materials, you may need to generate the report by Material Type groups.

Step 4: Examine the data for the first Material on the Detail tab. To see the details of any Source document, click on the row you wish to view. A Next arrow will appear at the beginning of the active row.

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Step 5: Double-clicking on the row will take you to the Source document. You can also select the row and click the "Go to Source" button.

Step 6: For assistance in determining why there is a discrepancy, the Minimum Sampling Guide, Contract BOM, and Acceptance Flow chart have been incorporated into this window. These are accessed by clicking on the "More Info" button. This opens the **Project Certification Detail** window.

Here is an example of the **More Info** tab of the Project Certification Detail window for Contract C201346 and Material of Asphalt Concrete Base Course, Type RB 25.0B.

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Project Certification Detail - More Info

Contract: C201346 Status: Processed Date: 07/01/2005

Source: Tickets ID: 4 How Accepted: Sample/Test

Material and Material Type

Material: Asphalt Concrete Base Course, Type RB 25.0B

UOM: Tons Project Certification Criticality: Critical

Material Type: Asphalt Bases & Pavements

How Received: Ticket How Accepted: Sample/Test

Contract Line Item

Line Item: Line Item: 5 : ASP CONC BASE CRS B25.0B Line Item Quantity: 11,389.000

UOM: Tons Plan: Estimated:

Source Quantity

Represented: 78.830 Accepted: PAR: Rejected:

Material Quantity

Paid/Used: 78.830 Accepted: Received: 78.830

CBOM Conversion Factor: Derived Source Material Quantity: 78.830

Close

Alt ID Distribution Go To Source Display Options More Info 1 of 2 Pages

The **More Info** tab displays the Minimum Sampling Guide and Contract Bill of Materials information. Now there is no need to navigate to additional windows to see this data.

Here is an example of the **Acceptance** tab of the Project Certification Detail window for Contract C201346 and Material of Asphalt Concrete Base Course, Type RB 25.0B.

Check	Value	OK	Stop	Remarks
Status Ok ?	Processed	✓		If record is VOID, do not accept material quantity.
Do Not Pay Replacement Indicated ?	No	✓		If DNP Replacement Indicated, do not accept material quantity.
Certifications Required ?	No	✓		
Certifications Present ?	N/A	✓		If certifications are required but not present, do not accept material
Small Quantity Allowed ?	No	✓		
Small Quantity Indicated ?	N/A	✓		If small quantity is allowed and checked, accept total quantity.
FIR Required ?	No	✓		If FIR is required and Pretest is N/A or No Match, material quantity
Pretest-No Match ?	N/A	✓		If FIR is required and Pretest is N/A or No Match, material quantity
Pretest-Alternate ID Required ?	N/A	✓		If FIR Required and Pretest is Alternate ID Required, accept Ticket
Pretest-Alternate ID Match From Sample ?	N/A	✓		If FIR is required and Pretest is Alternate ID Match From Sample, a
Sample Test Required?	Yes	✓	⛔	If sample test is required, material quantity will be accepted by sam
Pretested Required or Optional ?	No			
Pretest-No Match ?	N/A			If Pretest-Alternate ID No Match, accept Ticket total quantity.
Pretest-Alternate ID Required ?	N/A			If Pretest-Alternate ID Required, accept Ticket total quantity.
Pretest-Alternate ID Match Sample/FIR ?	N/A			If Pretest-Alternate ID Match Sample/FIR, accept Ticket total quant
None Of The Above ?	No			If none of the above, accept Ticket total quantity.

This tab lists the same steps for determining Accepted Quantities that previously required using the Project Acceptance flow chart.

From the More Info tab, you learned that the How Accepted method for this material is by Sample Test. The Acceptance tab confirms that there is no Accepted quantity because for this Material and Minimum Sampling Guide combination, the ticket does not contribute to the Accepted Quantity. The Accepted Quantity comes from Project Acceptance samples and there are none entered for this material.

This is the same process used to review the Contract Materials Discrepancy Report, only with easier access to the supporting data.

Step 7: After the discrepancy has been investigated and its cause determined, make any corrections needed. Regenerate the report. If a discrepancy still exists, enter a note of explanation on the Contract Material Quantities tab in the column **Constr Status**.

Step 8: Click on the Notepad icon and the following window opens. Enter your note explaining the discrepancies. When you are done, click OK and Save the record.

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Audit Materials (C201346) **Status & Notes**

Contract Material Quantities

Contract: C201346

Description (nickname):

Material Quantities (as of):

Critical	Material
Critical	Asphalt Concrete
Critical	Asphalt Concrete :
Critical	Asphalt Concrete :
Critical	Permanent Raised
Critical	Asphalt Binder, PC
Critical	Asphalt Concrete I
Critical	Asphalt Concrete :
Critical	Asphalt Concrete :
Critical	Patching Existing f
Minor	Asphalt Plant Mix,
Minor	Fertilizer - Tons
Minor	Incidental Stone B
Minor	Limestone (Agricu
Non-Crit	Glass Beads - Pou
Non-Crit	Seed - Pounds
Non-Crit	Thermoplastic for
Non-Crit	Thermoplastic for

Material: Asphalt Concrete Base Course, Type RB 25.0B - Tons

Plan: 11,389.000 **Estimated:** 6,254.120

Paid/Used: 6,254.120 **Accepted:** .000 **Received:** 6,254.120

Notes Log:

New Note:

(Re) Generate

Received	A
6,254.120	
4,476.930	
6,220.650	
.000	
.000	
.000	
.000	
.000	
.000	
.000	
921.220	
1.688	
547.090	
19.336	
28,000.000	(E
722.500	
48,000.000	
48,000.000	

1 to 17 of 17 rows

OK Cancel

Cancel values and return

The next time the Notes log is opened, your comment will be listed in the upper portion of the window, along with any comments entered by others. This log is in date and time order.

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Status & Notes

Material: Asphalt Concrete Base Course, Type RB 25.0B - Tons

Plan: 11,389.000 **Estimated:** 6,254.120

Paid/Used: 6,254.120 **Accepted:** .000 **Received:** 6,254.120

Notes Log:

—mnovello on 3/17/2006 12:23:43—
Reviewed Densities and QA lab reports. All mix produced and placed according to Specifications.

Step 9: Continue investigating remaining discrepancies, entering notes for those which cannot be resolved in HiCAMS.